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## SEQUENCE LISTING

&lt;110&gt; PRESIDENT AND FELLOWS OF HARVARD COLLEGE, et al.

<120> METHODS FOR MODULATING AN IMMUNE  
RESPONSE BY MODULATING KRC ACTIVITY

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&lt;170&gt; FastSEQ for Windows Version 4.0

&lt;210&gt; 1

&lt;211&gt; 8546

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (889)...(8106)

&lt;400&gt; 1

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His Ala Ser Ile Ile Pro Pro Glu Asp Leu Pro Gly Val Pro Lys Val	
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Phe Val Pro Arg Pro Ser Gln Val Ser Leu Lys Pro Thr Glu Glu Ala	
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His Lys Lys Glu Arg Lys Pro Gln Lys Pro Gly Lys Tyr Ile Cys Gln	
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Tyr Cys Ser Arg Pro Cys Ala Lys Pro Ser Val Leu Gln Lys His Ile	
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Ser Phe Lys Thr Lys Ser Asn Leu Tyr Lys His Arg Lys Ser His Ala	
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His Arg Ile Lys Ala Gly Leu Ala Ser Gly Met Gly Gly Glu Met Tyr	
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Pro His Gly Leu Glu Met Glu Arg Ile Pro Gly Glu Glu Phe Glu Glu	
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Val Ser Pro Pro Asn Thr Asn Ala Lys Ser Tyr Ala Glu Ile Ile Phe	
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Val Lys Pro Arg Arg Ser Ser Leu Ser Arg Arg Ser Ser Met Glu Ser	
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Pro Lys Ser Ser Leu Tyr Arg Glu Pro Leu Ser Ser His Ser Glu Lys	
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Thr Lys Pro Glu Gln Ser Leu Leu Ser Leu Gln His Pro Pro Ser Thr	
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Cys	Thr	Ile	Ser	Thr	Pro	His	His	Pro	Phe	Arg	Gly	Ser	Tyr	Ser	Phe	
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Asp	Asp	His	Ile	Thr	Asp	Ser	Glu	Ala	Leu	Ser	Arg	Ser	Ser	His	Val	
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Phe	Thr	Ser	His	Pro	Arg	Met	Leu	Lys	Pro	Gln	Pro	Ala	Ile	Glu	Leu	
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Pro	Gly	Pro	Ser	Asp	Ala	Ala	Arg	Asn	Leu	Pro	Leu	Glu	Ser	Thr	Lys	
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Lys Ala Pro Pro Lys Lys Lys Arg Leu Arg Leu Ala Glu Met Ala Gln	
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Ser Asp Met Arg Pro Lys Pro Leu Gly Thr His Met Leu Thr Val Pro	
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Ser His His Pro His Ala Arg Glu Met Arg Arg Ser Ala Ser Glu Gln	
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Ser Pro Asn Val Ser His Ser Ala His Met Thr Glu Thr Arg Ser Lys	
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Asp Ile Arg Leu Pro Pro Val Ala Pro Pro Ala Ser Ser Ser Ala Pro	
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Thr Gln Gln Gln Lys Arg Val Lys Glu Glu Glu Ala Ser Lys Ala Asp	
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Glu Lys Leu Glu Leu Val Lys Pro Cys Ser Val Val Leu Thr Ser Thr	
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Gln Ala Pro Gly Ser Glu Ala Leu Lys Glu Tyr Pro Gln Pro Ser Gly	
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Lys Pro His Arg Arg Gly Leu Thr Pro Leu Ser Val Lys Lys Glu Asp	
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Arg Met Thr Glu Val His Leu Pro Ser Leu Val Ser Pro Glu Gly Gln	
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aaa gat cta gct aga gtg gag aag gaa gaa gag agg aga ggg gag ccg	6033
Lys Asp Leu Ala Arg Val Glu Lys Glu Glu Glu Arg Arg Gly Glu Pro	
1700 1705 1710 1715	
gag gag gat gct cct gcc tcc cag aga ggg gag ccg gcg agg atc aaa	6081
Glu Glu Asp Ala Pro Ala Ser Gln Arg Gly Glu Pro Ala Arg Ile Lys	
1720 1725 1730	



atc ttc gaa gga ggg tac aaa tca aac gaa gag tat gta tat gtg cga	6129
Ile Phe Glu Gly Gly Tyr Lys Ser Asn Glu Glu Tyr Val Tyr Val Arg	
1735 1740 1745	
ggc cgc ggc cga ggg aaa tat gtt tgt gag gag tgt gga att cgc tgc	6177
Gly Arg Gly Arg Gly Lys Tyr Val Cys Glu Glu Cys Gly Ile Arg Cys	
1750 1755 1760	
aag aag ccc agc atg ctg aag aaa cac atc cgc acc cac act gac gtc	6225
Lys Lys Pro Ser Met Leu Lys Lys His Ile Arg Thr His Thr Asp Val	
1765 1770 1775	
cgg ccc tat gtg tgc aag cac tgt cac ttt gct ttt aaa acc aaa ggg	6273
Arg Pro Tyr Val Cys Lys His Cys His Phe Ala Phe Lys Thr Lys Gly	
1780 1785 1790 1795	
aat ctg act aag cac atg aag tcg aag gcc cac agc aaa aag tgc caa	6321
Asn Leu Thr Lys His Met Lys Ser Lys Ala His Ser Lys Lys Cys Gln	
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gag aca ggg gtg ctg gag gag ctg gaa gcc gaa gaa gga acc agt gac	6369
Glu Thr Gly Val Leu Glu Glu Leu Glu Ala Glu Glu Gly Thr Ser Asp	
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gac ctg ttc cag gac tcg gaa gga cga gag ggt tca gag gct gtg gag	6417
Asp Leu Phe Gln Asp Ser Glu Gly Arg Glu Gly Ser Glu Ala Val Glu	
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Glu His Gln Phe Ser Asp Leu Glu Asp Ser Asp Ser Asp Ser Asp Leu	
1845 1850 1855	
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Asp Glu Asp Glu Asp Glu Asp Glu Glu Glu Ser Gln Asp Glu Leu Ser	
1860 1865 1870 1875	
aga cca tcc tca gag gcg ccc ccg cct ggc cca cca cat gca ctg cgg	6561
Arg Pro Ser Ser Glu Ala Pro Pro Pro Gly Pro Pro His Ala Leu Arg	
1880 1885 1890	
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Ala Asp Ser Ser Pro Ile Leu Gly Pro Gln Pro Pro Asp Ala Pro Ala	
1895 1900 1905	
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Ser Gly Thr Glu Ala Thr Arg Gly Ser Ser Val Ser Glu Ala Glu Arg	
1910 1915 1920	
ctg aca gcc agc agc tgc tcc atg tcc agc cag agc atg ccg ggc ctc	6705
Leu Thr Ala Ser Ser Cys Ser Met Ser Ser Gln Ser Met Pro Gly Leu	
1925 1930 1935	
ccc tgg ctg gga ccg gcc cct ctg ggc tct gtg gag aaa gac aca ggc	6753
Pro Trp Leu Gly Pro Ala Pro Leu Gly Ser Val Glu Lys Asp Thr Gly	
1940 1945 1950 1955	
tca gcc ttg agc tac aag cct gtg tcc cca aga aga ccg tgg tcc cca	6801
Ser Ala Leu Ser Tyr Lys Pro Val Ser Pro Arg Arg Pro Trp Ser Pro	
1960 1965 1970	

agc aaa gaa gca ggc agc cgt cca cca cta gcc cgc aaa cac tcg cta	6849
Ser Lys Glu Ala Gly Ser Arg Pro Pro Leu Ala Arg Lys His Ser Leu	
1975 1980 1985	
acc aaa aac gac tca tct ccc cag cga tgc tcc ccg gcc cga gaa cca	6897
Thr Lys Asn Asp Ser Ser Pro Gln Arg Cys Ser Pro Ala Arg Glu Pro	
1990 1995 2000	
cag gcc tca gcc cca agc cca cct ggc ctg cac gtg gac cca gga agg	6945
Gln Ala Ser Ala Pro Ser Pro Pro Gly Leu His Val Asp Pro Gly Arg	
2005 2010 2015	
ggc atg ggc cct ctc cct tgt ggg tct cca aga ctt cag ctg tct cct	6993
Gly Met Gly Pro Leu Pro Cys Gly Ser Pro Arg Leu Gln Leu Ser Pro	
2020 2025 2030 2035	
ctc acc ctc tgc ccc ctg gga aga gaa ctg gcc cct cga gca cat gtg	7041
Leu Thr Leu Cys Pro Leu Gly Arg Glu Leu Ala Pro Arg Ala His Val	
2040 2045 2050	
ctc tcc aaa ctc gag ggt acc acc gac cca ggc ctc ccc aga tac tcg	7089
Leu Ser Lys Leu Glu Gly Thr Thr Asp Pro Gly Leu Pro Arg Tyr Ser	
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ccc acc agg aga tgg tct cca ggt cag gcc gag tca cca cca cgg tca	7137
Pro Thr Arg Arg Trp Ser Pro Gly Gln Ala Glu Ser Pro Pro Arg Ser	
2070 2075 2080	
gcg ccg cca ggg aag tgg gcc ttg gct ggg ccg ggc agc ccc tca gcg	7185
Ala Pro Pro Gly Lys Trp Ala Leu Ala Gly Pro Gly Ser Pro Ser Ala	
2085 2090 2095	
ggg gag cat ggc cca ggc ttg ggg ctg gcc cca cgg gtt ctc ttc ccg	7233
Gly Glu His Gly Pro Gly Leu Gly Leu Ala Pro Arg Val Leu Phe Pro	
2100 2105 2110 2115	
ccc gcg cct cta cct cac aag ctc ctc agc aga agc cca gag acc tgc	7281
Pro Ala Pro Leu Pro His Lys Leu Leu Ser Arg Ser Pro Glu Thr Cys	
2120 2125 2130	
gcc tcc ccg tgg cag aag gcc gag tcc cga agt ccc tcc tgc tca ccc	7329
Ala Ser Pro Trp Gln Lys Ala Glu Ser Arg Ser Pro Ser Cys Ser Pro	
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ggc cct gct cat cct ctc tcc tcc cga ccc ttc tcc gcc ctc cat gac	7377
Gly Pro Ala His Pro Leu Ser Ser Arg Pro Phe Ser Ala Leu His Asp	
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ttc cac ggc cac atc ctg gcc cgg aca gag gag aac atc ttc agc cac	7425
Phe His Gly His Ile Leu Ala Arg Thr Glu Glu Asn Ile Phe Ser His	
2165 2170 2175	
ctg cct ctg cac tcc cag cac ttg acc cgt gcc cca tgt ccc ttg att	7473
Leu Pro Leu His Ser Gln His Leu Thr Arg Ala Pro Cys Pro Leu Ile	
2180 2185 2190 2195	
ccc atc ggt ggg atc cag atg gtg cag gcc cgg cca gga gcc cac ccc	7521
Pro Ile Gly Gly Ile Gln Met Val Gln Ala Arg Pro Gly Ala His Pro	
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acc ctg ctg cca ggg ccc acc gca gcc tgg gtc agt ggc ttc tcc ggg 7569  
 Thr Leu Leu Pro Gly Pro Thr Ala Ala Trp Val Ser Gly Phe Ser Gly  
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ggg ggc agc gac ctg aca ggg gcc cgg gag gcc cag gag cga ggc cgc 7617  
 Gly Gly Ser Asp Leu Thr Gly Ala Arg Glu Ala Gln Glu Arg Gly Arg  
 2230 2235 2240

tgg agt ccc act gag agc tcg tca gcc tcc gtg tcg cct gtg gct aag 7665  
 Trp Ser Pro Thr Glu Ser Ser Ser Ala Ser Val Ser Pro Val Ala Lys  
 2245 2250 2255

gtc tcc aaa ttc aca ctc tcc tca gag ctg gag ggc agg gac tac ccc 7713  
 Val Ser Lys Phe Thr Leu Ser Ser Glu Leu Glu Gly Arg Asp Tyr Pro  
 2260 2265 2270 2275

aag gag agg gag agg acc ggc gga ggc ccg ggc agg cct cct gac tgg 7761  
 Lys Glu Arg Glu Arg Thr Gly Gly Gly Pro Gly Arg Pro Pro Asp Trp  
 2280 2285 2290

aca ccc cat ggg acc ggg gca cct gca gag ccc aca ccc acg cac agc 7809  
 Thr Pro His Gly Thr Gly Ala Pro Ala Glu Pro Thr Pro Thr His Ser  
 2295 2300 2305

ccc tgc acc cca ccc gac acc ttg ccc cgg ccg ccc cag gga cgc cgg 7857  
 Pro Cys Thr Pro Pro Asp Thr Leu Pro Arg Pro Pro Gln Gly Arg Arg  
 2310 2315 2320

gca gcg cag tcc tgg agc ccc cgc ttg gag tcc ccg cgt gca ccg gcc 7905  
 Ala Ala Gln Ser Trp Ser Pro Arg Leu Glu Ser Pro Arg Ala Pro Ala  
 2325 2330 2335

aac ccc gag cct tct gcc acc ccg ccg ctg gac cgc agc agc tct gtg 7953  
 Asn Pro Glu Pro Ser Ala Thr Pro Pro Leu Asp Arg Ser Ser Ser Val  
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ggc tgc ctg gca gag gcc tct gcc cgc ttc cca gcc cgg acg agg aac 8001  
 Gly Cys Leu Ala Glu Ala Ser Ala Arg Phe Pro Ala Arg Thr Arg Asn  
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ctc tcc ggg gaa tcc agg acc agg cag gac tcc ccc aag ccc tca gga 8049  
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agt ggg gag ccc agg gca cat cca cat cag cct gag gac agg gtt ccc 8097  
 Ser Gly Glu Pro Arg Ala His Pro His Gln Pro Glu Asp Arg Val Pro  
 2390 2395 2400

ccc aac gct tagcctctct ccaactgctt cagcatctgg cttccagtgt 8146  
 Pro Asn Ala  
 2405

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 <211> 2406  
 <212> PRT  
 <213> Homo sapiens

<400> 2

Met	Asp	Pro	Glu	Gln	Ser	Val	Lys	Gly	Thr	Lys	Lys	Ala	Glu	Gly	Ser	1	5	10	15
Pro	Arg	Lys	Arg	Leu	Thr	Lys	Gly	Glu	Ala	Ile	Gln	Thr	Ser	Val	Ser	20	25	30	
Ser	Ser	Val	Pro	Tyr	Pro	Gly	Ser	Gly	Thr	Ala	Pro	Thr	Gln	Glu	Ser	35	40	45	
Pro	Ala	Gln	Glu	Leu	Leu	Ala	Pro	Gln	Pro	Phe	Pro	Gly	Pro	Ser	Ser	50	55	60	
Val	Leu	Arg	Glu	Gly	Ser	Gln	Glu	Lys	Thr	Gly	Gln	Gln	Gln	Lys	Pro	65	70	75	80
Pro	Lys	Arg	Pro	Pro	Ile	Glu	Ala	Ser	Val	His	Ile	Ser	His	Val	Pro	85	90	95	
Gln	His	Pro	Leu	Thr	Pro	Ala	Phe	Met	Ser	Pro	Gly	Lys	Pro	Glu	His	100	105	110	
Leu	Leu	Glu	Gly	Ser	Thr	Trp	Gln	Leu	Val	Ser	Pro	Met	Arg	Leu	Gly	115	120	125	
Pro	Ser	Gly	Ser	Leu	Leu	Ala	Pro	Gly	Leu	His	Pro	Gln	Ser	Gln	Leu	130	135	140	
Leu	Pro	Ser	His	Ala	Ser	Ile	Ile	Pro	Pro	Glu	Asp	Leu	Pro	Gly	Val	145	150	155	160
Pro	Lys	Val	Phe	Val	Pro	Arg	Pro	Ser	Gln	Val	Ser	Leu	Lys	Pro	Thr	165	170	175	
Glu	Glu	Ala	His	Lys	Lys	Glu	Arg	Lys	Pro	Gln	Lys	Pro	Gly	Lys	Tyr	180	185	190	
Ile	Cys	Gln	Tyr	Cys	Ser	Arg	Pro	Cys	Ala	Lys	Pro	Ser	Val	Leu	Gln	195	200	205	
Lys	His	Ile	Arg	Ser	His	Thr	Gly	Glu	Arg	Pro	Tyr	Pro	Cys	Gly	Pro	210	215	220	
Cys	Gly	Phe	Ser	Phe	Lys	Thr	Lys	Ser	Asn	Leu	Tyr	Lys	His	Arg	Lys	225	230	235	240
Ser	His	Ala	His	Arg	Ile	Lys	Ala	Gly	Leu	Ala	Ser	Gly	Met	Gly	Gly	245	250	255	
Glu	Met	Tyr	Pro	His	Gly	Leu	Glu	Met	Glu	Arg	Ile	Pro	Gly	Glu	Glu	260	265	270	
Phe	Glu	Glu	Pro	Thr	Glu	Gly	Glu	Ser	Thr	Asp	Ser	Glu	Glu	Glu	Thr	275	280	285	
Ser	Ala	Thr	Ser	Gly	His	Pro	Ala	Glu	Leu	Ser	Pro	Arg	Pro	Lys	Gln	290	295	300	
Pro	Leu	Leu	Ser	Ser	Gly	Leu	Tyr	Ser	Ser	Gly	Ser	His	Ser	Ser	Ser	305	310	315	320
His	Glu	Arg	Cys	Ser	Leu	Ser	Gln	Ser	Ser	Thr	Ala	Gln	Ser	Leu	Glu	325	330	335	
Asp	Pro	Pro	Pro	Phe	Val	Glu	Pro	Ser	Ser	Glu	His	Pro	Leu	Ser	His	340	345	350	
Lys	Pro	Glu	Asp	Thr	His	Thr	Ile	Lys	Gln	Lys	Leu	Ala	Leu	Arg	Leu	355	360	365	
Ser	Glu	Arg	Lys	Lys	Val	Ile	Asp	Glu	Gln	Ala	Phe	Leu	Ser	Pro	Gly	370	375	380	
Ser	Lys	Gly	Ser	Thr	Glu	Ser	Gly	Tyr	Phe	Ser	Arg	Ser	Glu	Ser	Ala	385	390	395	400
Glu	Gln	Gln	Val	Ser	Pro	Pro	Asn	Thr	Asn	Ala	Lys	Ser	Tyr	Ala	Glu	405	410	415	
Ile	Ile	Phe	Gly	Lys	Cys	Gly	Arg	Ile	Gly	Gln	Arg	Thr	Ala	Met	Leu	420	425	430	

Thr Ala Thr Ser Thr Gln Pro Leu Leu Pro Leu Ser Thr Glu Asp Lys  
 435 440 445  
 Pro Ser Leu Val Pro Leu Ser Val Pro Arg Thr Gln Val Ile Glu His  
 450 455 460  
 Ile Thr Lys Leu Ile Thr Ile Asn Glu Ala Val Val Asp Thr Ser Glu  
 465 470 475 480  
 Ile Asp Ser Val Lys Pro Arg Arg Ser Ser Leu Ser Arg Arg Ser Ser  
 485 490 495  
 Met Glu Ser Pro Lys Ser Ser Leu Tyr Arg Glu Pro Leu Ser Ser His  
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 Ser Glu Lys Thr Lys Pro Glu Gln Ser Leu Leu Ser Leu Gln His Pro  
 515 520 525  
 Pro Ser Thr Ala Pro Pro Val Pro Leu Leu Arg Ser His Ser Met Pro  
 530 535 540  
 Ser Ala Ala Cys Thr Ile Ser Thr Pro His His Pro Phe Arg Gly Ser  
 545 550 555 560  
 Tyr Ser Phe Asp Asp His Ile Thr Asp Ser Glu Ala Leu Ser Arg Ser  
 565 570 575  
 Ser His Val Phe Thr Ser His Pro Arg Met Leu Lys Pro Gln Pro Ala  
 580 585 590  
 Ile Glu Leu Pro Leu Gly Gly Glu Tyr Ser Ser Glu Glu Pro Gly Pro  
 595 600 605  
 Ser Ser Lys Asp Thr Ala Ser Lys Pro Ser Asp Glu Val Glu Pro Lys  
 610 615 620  
 Glu Ser Glu Leu Thr Lys Lys Thr Lys Lys Gly Leu Lys Thr Lys Gly  
 625 630 635 640  
 Val Ile Tyr Glu Cys Asn Ile Cys Gly Ala Arg Tyr Lys Lys Arg Asp  
 645 650 655  
 Asn Tyr Glu Ala His Lys Lys Tyr Tyr Cys Ser Glu Leu Gln Ile Ala  
 660 665 670  
 Lys Pro Ile Ser Ala Gly Thr His Thr Ser Pro Glu Ala Glu Lys Ser  
 675 680 685  
 Gln Ile Glu His Glu Pro Trp Ser Gln Met Met His Tyr Lys Leu Gly  
 690 695 700  
 Thr Thr Leu Glu Leu Thr Pro Leu Arg Lys Arg Arg Lys Glu Lys Ser  
 705 710 715 720  
 Leu Gly Asp Glu Glu Glu Pro Pro Ala Phe Glu Ser Thr Lys Ser Gln  
 725 730 735  
 Phe Gly Ser Pro Gly Pro Ser Asp Ala Ala Arg Asn Leu Pro Leu Glu  
 740 745 750  
 Ser Thr Lys Ser Pro Ala Glu Pro Ser Lys Ser Val Pro Ser Leu Glu  
 755 760 765  
 Gly Pro Thr Gly Phe Gln Pro Arg Thr Pro Lys Pro Gly Ser Gly Ser  
 770 775 780  
 Glu Ser Gly Lys Glu Arg Arg Thr Thr Ser Lys Glu Ile Ser Val Ile  
 785 790 795 800  
 Gln His Thr Ser Ser Phe Glu Lys Ser Asp Ser Leu Glu Gln Pro Ser  
 805 810 815  
 Gly Leu Glu Gly Glu Asp Lys Pro Leu Ala Gln Phe Pro Ser Pro Pro  
 820 825 830  
 Pro Ala Pro His Gly Arg Ser Ala His Ser Leu Gln Pro Lys Leu Val  
 835 840 845  
 Arg Gln Pro Asn Ile Gln Val Pro Glu Ile Leu Val Thr Glu Glu Pro  
 850 855 860  
 Asp Arg Pro Asp Thr Glu Pro Glu Pro Pro Pro Lys Glu Pro Glu Lys  
 865 870 875 880  
 Thr Glu Glu Phe Gln Trp Pro Gln Arg Ser Gln Thr Leu Ala Gln Leu  
 885 890 895  
 Pro Ala Glu Lys Ala Pro Pro Lys Lys Lys Arg Leu Arg Leu Ala Glu  
 900 905 910

Met Ala Gln Ser Ser Gly Glu Ser Ser Phe Glu Ser Ser Val Pro Leu  
 915 920 925  
 Ser Arg Ser Pro Ser Gln Glu Ser Asn Val Ser Leu Ser Gly Ser Ser  
 930 935 940  
 Arg Ser Ala Ser Phe Glu Arg Asp Asp His Gly Lys Ala Glu Ala Pro  
 945 950 955 960  
 Asp Pro Ser Ser Asp Met Arg Pro Lys Pro Leu Gly Thr His Met Leu  
 965 970 975  
 Thr Val Pro Ser His His Pro His Ala Arg Glu Met Arg Arg Ser Ala  
 980 985 990  
 Ser Glu Gln Ser Pro Asn Val Ser His Ser Ala His Met Thr Glu Thr  
 995 1000 1005  
 Arg Ser Lys Ser Phe Asp Tyr Gly Ser Leu Ser Leu Thr Gly Pro Ser  
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 1025 1030 1035 1040  
 Arg Lys Cys Phe Leu Val Arg Ser Pro Ser Leu Ser Arg Pro Pro Glu  
 1045 1050 1055  
 Ser Glu Leu Glu Val Ala Pro Lys Gly Arg Gln Glu Ser Glu Glu Pro  
 1060 1065 1070  
 Gln Pro Ser Ser Lys Pro Ser Ala Lys Ser Ser Leu Ser Gln Ile  
 1075 1080 1085  
 Ser Ser Ala Ala Thr Ser His Gly Gly Pro Pro Gly Gly Lys Gly Pro  
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 Gly Gln Asp Arg Pro Ala Leu Gly Pro Thr Val Pro Tyr Thr Glu Ala  
 1105 1110 1115 1120  
 Leu Gln Val Phe His His Pro Val Ala Gln Thr Pro Leu His Glu Lys  
 1125 1130 1135  
 Pro Tyr Leu Pro Pro Val Ser Leu Phe Ser Phe Gln His Leu Val  
 1140 1145 1150  
 Gln His Glu Pro Gly Gln Ser Pro Glu Phe Phe Ser Thr Gln Ala Met  
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 Ser Ser Leu Leu Ser Ser Pro Tyr Ser Met Pro Pro Leu Pro Pro Ser  
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 Phe Arg Gln Pro Pro Ser Phe Leu Pro Met Pro Tyr Pro Thr Ser Ser  
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 Ala Leu Ser Ser Gly Phe Phe Leu Pro Leu Gln Ser Gln Phe Ala Leu  
 1235 1240 1245  
 Gln Leu Pro Gly Asp Val Glu Ser His Leu Pro Gln Ile Lys Thr Ser  
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 Ser Tyr Gly Ser Ala Met Tyr Thr Thr Leu Ser Gln Ile Leu Val Thr  
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 Gly Pro Gly Pro Ser Gly Leu Ser Glu Glu Gln Ser Arg Ala Phe Pro  
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Thr Pro Tyr Leu Arg Val Pro Val Thr Leu Pro Glu Arg Lys Gly Thr  
 1395 1400 1405  
 Ser Leu Ser Ser Glu Ser Ile Leu Ser Leu Glu Gly Ser Ser Ser Thr  
 1410 1415 1420  
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 Lys Ala Asp Glu Lys Leu Glu Leu Val Lys Pro Cys Ser Val Val Leu  
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 Gln Gly Gln Gly Arg Arg Glu Leu Glu Met Leu Ser Ser Leu Ser Ser  
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 Ser His Gly Gln Ala Pro Gly Ser Glu Ala Leu Lys Glu Tyr Pro Gln  
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 1555 1560 1565  
 Ser Ser Leu Pro Leu Ser Glu Thr Ser Ser Arg Pro Ala Lys Ser Gln  
 1570 1575 1580  
 Glu Gly Thr Asp Ser Lys Lys Val Leu Gln Phe Pro Ser Leu His Thr  
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 Ile Gln His Ala Asp Arg Arg Ser Ser Val Tyr Ala Gly Trp Cys Ile  
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 Ser Leu Tyr Asn Pro Asn Leu Pro Gly Val Ser Thr Lys Ala Ala Leu  
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 Ser Leu Leu Arg Ser Lys Gln Lys Val Ser Lys Glu Thr Tyr Thr Met  
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 Glu Gly Gln Lys Asp Leu Ala Arg Val Glu Lys Glu Glu Glu Arg Arg  
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 Thr Ser Asp Asp Leu Phe Gln Asp Ser Glu Gly Arg Glu Gly Ser Glu  
 1825 1830 1835 1840  
 Ala Val Glu Glu His Gln Phe Ser Asp Leu Glu Asp Ser Asp Ser Asp  
 1845 1850 1855  
 Ser Asp Leu Asp Glu Asp Glu Asp Glu Asp Glu Glu Glu Ser Gln Asp  
 1860 1865 1870

Glu Leu Ser Arg Pro Ser Ser Glu Ala Pro Pro Pro Gly Pro Pro His  
 1875 1880 1885  
 Ala Leu Arg Ala Asp Ser Ser Pro Ile Leu Gly Pro Gln Pro Pro Asp  
 1890 1895 1900  
 Ala Pro Ala Ser Gly Thr Glu Ala Thr Arg Gly Ser Ser Val Ser Glu  
 1905 1910 1915 1920  
 Ala Glu Arg Leu Thr Ala Ser Ser Cys Ser Met Ser Ser Gln Ser Met  
 1925 1930 1935  
 Pro Gly Leu Pro Trp Leu Gly Pro Ala Pro Leu Gly Ser Val Glu Lys  
 1940 1945 1950  
 Asp Thr Gly Ser Ala Leu Ser Tyr Lys Pro Val Ser Pro Arg Arg Pro  
 1955 1960 1965  
 Trp Ser Pro Ser Lys Glu Ala Gly Ser Arg Pro Pro Leu Ala Arg Lys  
 1970 1975 1980  
 His Ser Leu Thr Lys Asn Asp Ser Ser Pro Gln Arg Cys Ser Pro Ala  
 1985 1990 1995 2000  
 Arg Glu Pro Gln Ala Ser Ala Pro Ser Pro Pro Gly Leu His Val Asp  
 2005 2010 2015  
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 2020 2025 2030  
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 2290 2295 2300  
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 Ala Pro Ala Asn Pro Glu Pro Ser Ala Thr Pro Pro Leu Asp Arg Ser  
 2340 2345 2350



Ser Ser Val Gly Cys Leu Ala Glu Ala Ser Ala Arg Phe Pro Ala Arg  
           2355                          2360                          2365  
 Thr Arg Asn Leu Ser Gly Glu Ser Arg Thr Arg Gln Asp Ser Pro Lys  
           2370                          2375                          2380  
 Pro Ser Gly Ser Gly Glu Pro Arg Ala His Pro His Gln Pro Glu Asp  
 2385                          2390                          2395                          2400  
 Arg Val Pro Pro Asn Ala  
                           2405

<210> 3  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
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<400> 3  
 caagaatcca aactcaccag 20

<210> 4  
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<400> 4  
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<210> 5  
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<220>  
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<400> 5  
 ctccaataca gaattcaagg gc 22

<210> 6  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> synthetic oligonucleotide

<400> 6  
 tttaggttgg ccagtgtgtg tg 22

<210> 7  
 <211> 852  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 7

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Pro Ser Val Leu Gln Lys His Ile Arg Ser His Thr Gly Glu Arg Pro
1      5      10      15
Tyr Pro Cys Gly Pro Cys Gly Phe Ser Phe Lys Thr Lys Ser Asn Leu
20      25      30
Tyr Lys His Arg Lys Ser His Ala His Arg Ile Lys Ala Gly Leu Ala
35      40      45
Ser Gly Met Gly Gly Glu Met Tyr Pro His Gly Leu Glu Met Glu Arg
50      55      60
Ile Pro Gly Glu Glu Phe Glu Glu Pro Thr Glu Gly Glu Ser Thr Asp
65      70      75      80
Ser Glu Glu Glu Thr Ser Ala Thr Ser Gly His Pro Ala Glu Leu Ser
85      90      95
Pro Arg Pro Lys Gln Pro Leu Leu Ser Ser Gly Leu Tyr Ser Ser Gly
100     105     110
Ser His Ser Ser Ser His Glu Arg Cys Ser Leu Ser Gln Ser Ser Thr
115     120     125
Ala Gln Ser Leu Glu Asp Pro Pro Pro Phe Val Glu Pro Ser Ser Glu
130     135     140
His Pro Leu Ser His Lys Pro Glu Asp Thr His Thr Ile Lys Gln Lys
145     150     155     160
Leu Ala Leu Arg Leu Ser Glu Arg Lys Lys Val Ile Asp Glu Gln Ala
165     170     175
Phe Leu Ser Pro Gly Ser Lys Gly Ser Thr Glu Ser Gly Tyr Phe Ser
180     185     190
Arg Ser Glu Ser Ala Glu Gln Gln Val Ser Pro Pro Asn Thr Asn Ala
195     200     205
Lys Ser Tyr Ala Glu Ile Ile Phe Gly Lys Cys Gly Arg Ile Gly Gln
210     215     220
Arg Thr Ala Met Leu Thr Ala Thr Ser Thr Gln Pro Leu Leu Pro Leu
225     230     235     240
Ser Thr Glu Asp Lys Pro Ser Leu Val Pro Leu Ser Val Pro Arg Thr
245     250     255
Gln Val Ile Glu His Ile Thr Lys Leu Ile Thr Ile Asn Glu Ala Val
260     265     270
Val Asp Thr Ser Glu Ile Asp Ser Val Lys Pro Arg Arg Ser Ser Leu
275     280     285
Ser Arg Arg Ser Ser Met Glu Ser Pro Lys Ser Ser Leu Tyr Arg Glu
290     295     300
Pro Leu Ser Ser His Ser Glu Lys Thr Lys Pro Glu Gln Ser Leu Leu
305     310     315     320
Ser Leu Gln His Pro Pro Ser Thr Ala Pro Pro Val Pro Leu Leu Arg
325     330     335
Ser His Ser Met Pro Ser Ala Ala Cys Thr Ile Ser Thr Pro His His
340     345     350
Pro Phe Arg Gly Ser Tyr Ser Phe Asp Asp His Ile Thr Asp Ser Glu
355     360     365
Ala Leu Ser Arg Ser Ser His Val Phe Thr Ser His Pro Arg Met Leu
370     375     380
Lys Pro Gln Pro Ala Ile Glu Leu Pro Leu Gly Gly Glu Tyr Ser Ser
385     390     395     400
Glu Glu Pro Gly Pro Ser Ser Lys Asp Thr Ala Ser Lys Pro Ser Asp
405     410     415
Glu Val Glu Pro Lys Glu Ser Glu Leu Thr Lys Lys Thr Lys Lys Gly
420     425     430
Leu Lys Thr Lys Gly Val Ile Tyr Glu Cys Asn Ile Cys Gly Ala Arg
435     440     445
Tyr Lys Lys Arg Asp Asn Tyr Glu Ala His Lys Lys Tyr Tyr Cys Ser
450     455     460
Glu Leu Gln Ile Ala Lys Pro Ile Ser Ala Gly Thr His Thr Ser Pro
465     470     475     480

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Glu Ala Glu Lys Ser Gln Ile Glu His Glu Pro Trp Ser Gln Met Met  
 485 490 495  
 His Tyr Lys Leu Gly Thr Thr Leu Glu Leu Thr Pro Leu Arg Lys Arg  
 500 505 510  
 Arg Lys Glu Lys Ser Leu Gly Asp Glu Glu Glu Pro Pro Ala Phe Glu  
 515 520 525  
 Ser Thr Lys Ser Gln Phe Gly Ser Pro Gly Pro Ser Asp Ala Ala Arg  
 530 535 540  
 Asn Leu Pro Leu Glu Ser Thr Lys Ser Pro Ala Glu Pro Ser Lys Ser  
 545 550 555 560  
 Val Pro Ser Leu Glu Gly Pro Thr Gly Phe Gln Pro Arg Thr Pro Lys  
 565 570 575  
 Pro Gly Ser Gly Ser Glu Ser Gly Lys Glu Arg Arg Thr Thr Ser Lys  
 580 585 590  
 Glu Ile Ser Val Ile Gln His Thr Ser Ser Phe Glu Lys Ser Asp Ser  
 595 600 605  
 Leu Glu Gln Pro Ser Gly Leu Glu Gly Glu Asp Lys Pro Leu Ala Gln  
 610 615 620  
 Phe Pro Ser Pro Pro Pro Ala Pro His Gly Arg Ser Ala His Ser Leu  
 625 630 635 640  
 Gln Pro Lys Leu Val Arg Gln Pro Asn Ile Gln Val Pro Glu Ile Leu  
 645 650 655  
 Val Thr Glu Glu Pro Asp Arg Pro Asp Thr Glu Pro Glu Pro Pro  
 660 665 670  
 Lys Glu Pro Glu Lys Thr Glu Glu Phe Gln Trp Pro Gln Arg Ser Gln  
 675 680 685  
 Thr Leu Ala Gln Leu Pro Ala Glu Lys Ala Pro Pro Lys Lys Lys Arg  
 690 695 700  
 Leu Arg Leu Ala Glu Met Ala Gln Ser Ser Gly Glu Ser Ser Phe Glu  
 705 710 715 720  
 Ser Ser Val Pro Leu Ser Arg Ser Pro Ser Gln Glu Ser Asn Val Ser  
 725 730 735  
 Leu Ser Gly Ser Ser Arg Ser Ala Ser Phe Glu Arg Asp Asp His Gly  
 740 745 750  
 Lys Ala Glu Ala Pro Asp Pro Ser Ser Asp Met Arg Pro Lys Pro Leu  
 755 760 765  
 Gly Thr His Met Leu Thr Val Pro Ser His His Pro His Ala Arg Glu  
 770 775 780  
 Met Arg Arg Ser Ala Ser Glu Gln Ser Pro Asn Val Ser His Ser Ala  
 785 790 795 800  
 His Met Thr Glu Thr Arg Ser Lys Ser Phe Asp Tyr Gly Ser Leu Ser  
 805 810 815  
 Leu Thr Gly Pro Ser Ala Pro Ala Pro Val Ala Pro Pro Ala Gly Glu  
 820 825 830  
 Ala Pro Pro Glu Arg Arg Lys Cys Phe Leu Val Arg Ser Pro Ser Leu  
 835 840 845  
 Ser Arg Pro Pro  
 850

&lt;210&gt; 8

&lt;211&gt; 786

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 8

Glu Met Leu Ser Ser Leu Ser Ser Asp Pro Ser Asp Thr Lys Glu Ile  
 1 5 10 15  
 Pro Pro Leu Pro His Pro Ala Leu Ser His Gly Gln Ala Pro Gly Ser  
 20 25 30

Glu Ala Leu Lys Glu Tyr Pro Gln Pro Ser Gly Lys Pro His Arg Arg  
 35 40 45  
 Gly Leu Thr Pro Leu Ser Val Lys Lys Glu Asp Ser Lys Glu Gln Pro  
 50 55 60  
 Asp Leu Pro Ser Leu Ala Pro Pro Ser Ser Leu Pro Leu Ser Glu Thr  
 65 70 75 80  
 Ser Ser Arg Pro Ala Lys Ser Gln Glu Gly Thr Asp Ser Lys Lys Val  
 85 90 95  
 Leu Gln Phe Pro Ser Leu His Thr Thr Thr Asn Val Ser Trp Cys Tyr  
 100 105 110  
 Leu Asn Tyr Ile Lys Pro Asn His Ile Gln His Ala Asp Arg Arg Ser  
 115 120 125  
 Ser Val Tyr Ala Gly Trp Cys Ile Ser Leu Tyr Asn Pro Asn Leu Pro  
 130 135 140  
 Gly Val Ser Thr Lys Ala Ala Leu Ser Leu Leu Arg Ser Lys Gln Lys  
 145 150 155 160  
 Val Ser Lys Glu Thr Tyr Thr Met Ala Thr Ala Pro His Pro Glu Ala  
 165 170 175  
 Gly Arg Leu Val Pro Ser Ser Ser Arg Lys Pro Arg Met Thr Glu Val  
 180 185 190  
 His Leu Pro Ser Leu Val Ser Pro Glu Gly Gln Lys Asp Leu Ala Arg  
 195 200 205  
 Val Glu Lys Glu Glu Glu Arg Arg Gly Glu Pro Glu Glu Asp Ala Pro  
 210 215 220  
 Ala Ser Gln Arg Gly Glu Pro Ala Arg Ile Lys Ile Phe Glu Gly Gly  
 225 230 235 240  
 Tyr Lys Ser Asn Glu Glu Tyr Val Tyr Val Arg Gly Arg Gly Arg Gly  
 245 250 255  
 Lys Tyr Val Cys Glu Glu Cys Gly Ile Arg Cys Lys Lys Pro Ser Met  
 260 265 270  
 Leu Lys Lys His Ile Arg Thr His Thr Asp Val Arg Pro Tyr Val Cys  
 275 280 285  
 Lys His Cys His Phe Ala Phe Lys Thr Lys Gly Asn Leu Thr Lys His  
 290 295 300  
 Met Lys Ser Lys Ala His Ser Lys Lys Cys Gln Glu Thr Gly Val Leu  
 305 310 315 320  
 Glu Glu Leu Glu Ala Glu Glu Gly Thr Ser Asp Asp Leu Phe Gln Asp  
 325 330 335  
 Ser Glu Gly Arg Glu Gly Ser Glu Ala Val Glu Glu His Gln Phe Ser  
 340 345 350  
 Asp Leu Glu Asp Ser Asp Ser Asp Ser Asp Leu Asp Glu Asp Glu Asp  
 355 360 365  
 Glu Asp Glu Glu Glu Ser Gln Asp Glu Leu Ser Arg Pro Ser Ser Glu  
 370 375 380  
 Ala Pro Pro Pro Gly Pro Pro His Ala Leu Arg Ala Asp Ser Ser Pro  
 385 390 395 400  
 Ile Leu Gly Pro Gln Pro Pro Asp Ala Pro Ala Ser Gly Thr Glu Ala  
 405 410 415  
 Thr Arg Gly Ser Ser Val Ser Glu Ala Glu Arg Leu Thr Ala Ser Ser  
 420 425 430  
 Cys Ser Met Ser Ser Gln Ser Met Pro Gly Leu Pro Trp Leu Gly Pro  
 435 440 445  
 Ala Pro Leu Gly Ser Val Glu Lys Asp Thr Gly Ser Ala Leu Ser Tyr  
 450 455 460  
 Lys Pro Val Ser Pro Arg Arg Pro Trp Ser Pro Ser Lys Glu Ala Gly  
 465 470 475 480  
 Ser Arg Pro Pro Leu Ala Arg Lys His Ser Leu Thr Lys Asn Asp Ser  
 485 490 495  
 Ser Pro Gln Arg Cys Ser Pro Ala Arg Glu Pro Gln Ala Ser Ala Pro  
 500 505 510

Ser Pro Pro Gly Leu His Val Asp Pro Gly Arg Gly Met Gly Pro Leu  
 515 520 525  
 Pro Cys Gly Ser Pro Arg Leu Gln Leu Ser Pro Leu Thr Leu Cys Pro  
 530 535 540  
 Leu Gly Arg Glu Leu Ala Pro Arg Ala His Val Leu Ser Lys Leu Glu  
 545 550 555 560  
 Gly Thr Thr Asp Pro Gly Leu Pro Arg Tyr Ser Pro Thr Arg Arg Trp  
 565 570 575  
 Ser Pro Gly Gln Ala Glu Ser Pro Pro Arg Ser Ala Pro Pro Gly Lys  
 580 585 590  
 Trp Ala Leu Ala Gly Pro Gly Ser Pro Ser Ala Gly Glu His Gly Pro  
 595 600 605  
 Gly Leu Gly Leu Ala Pro Arg Val Leu Phe Pro Pro Ala Pro Leu Pro  
 610 615 620  
 His Lys Leu Leu Ser Arg Ser Pro Glu Thr Cys Ala Ser Pro Trp Gln  
 625 630 635 640  
 Lys Ala Glu Ser Arg Ser Pro Ser Cys Ser Pro Gly Pro Ala His Pro  
 645 650 655  
 Leu Ser Ser Arg Pro Phe Ser Ala Leu His Asp Phe His Gly His Ile  
 660 665 670  
 Leu Ala Arg Thr Glu Glu Asn Ile Phe Ser His Leu Pro Leu His Ser  
 675 680 685  
 Gln His Leu Thr Arg Ala Pro Cys Pro Leu Ile Pro Ile Gly Gly Ile  
 690 695 700  
 Gln Met Val Gln Ala Arg Pro Gly Ala His Pro Thr Leu Leu Pro Gly  
 705 710 715 720  
 Pro Thr Ala Ala Trp Val Ser Gly Phe Ser Gly Gly Gly Ser Asp Leu  
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 Thr Gly Ala Arg Glu Ala Gln Glu Arg Gly Arg Trp Ser Pro Thr Glu  
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 Ser Ser Ser Ala Ser Val Ser Pro Val Ala Lys Val Ser Lys Phe Thr  
 755 760 765  
 Leu Ser Ser Glu Leu Glu Gly Arg Asp Tyr Pro Lys Glu Arg Glu Arg  
 770 775 780  
 Thr Gly  
 785